



# Mobile Home Residents and Hurricane Vulnerability in South Florida: Research Gaps and Challenges

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**Abstract** In South Florida there are several social and logistical challenges to surveying and advocating for mobile home residents regarding vulnerability to natural hazards such as sea level rise and hurricanes. These residents have consequently been understudied despite historically exhibiting higher vulnerability and lower resilience. This exploratory study uses a social-ecological framework to highlight individual-, community-, and institutional-level challenges and research gaps encountered when working with mobile home residents. These observations represent a longer-term opportunity to further refine our understanding of natural hazard vulnerability, build increased resilience among vulnerable populations, and improve health equity in South Florida and beyond.

**Keywords** Disaster preparedness · Mobile homes · Social-ecological model · Vulnerability

## 1 Introduction

Mobile home residents remain a vulnerable yet understudied subpopulation in regions prone to natural hazards (Kusenbach et al. 2010). Although the characteristics and distributions of mobile home residents have been of interest to social scientists for over 50 years (French and Hadden 1965), a limited social

science literature has explored issues such as socioeconomic differences (French and Hadden 1968), civic engagement (Edwards et al. 1973), retiree sociopolitics (Irby 2000), the stigma often associated with living in trailer parks (Kusenbach 2009), crime (McCarty 2010), and immigrant identity (Kusenbach 2015). With increased storm intensity due to climate change, interest has shifted to mobile home vulnerability due to natural hazards such as tornadoes and hurricanes (Schmidlin et al. 2009; Chaney and Weaver 2010; Kusenbach et al. 2010; Ash 2016).

In South Florida, a region with high storm surge vulnerability, we have found that the social organization of mobile home residents presents multilevel challenges for assessing knowledge, attitudes, and practices related to hurricane preparedness, as well as for hazard-related education and communication. Mobile homes are particularly vulnerable to hurricane-force wind damage, and residents of these communities tend to be less economically resilient than the general population (Cutter and Emrich 2006). In Florida older adult vulnerability is also associated with a higher concentration of mobile homes, as these communities offer a more affordable housing option to low-income elderly residents (Wang and Yarnal 2012). It is thus important to understand the perspectives and behaviors of mobile home residents because they are more likely to increase the local burden on social services if their residence is lost during a major storm event. We apply a simplified social-ecological framework to summarize individual-, community-, and institutional-level research challenges associated with mobile home residents in South Florida (Fig. 1).

## 2 Individual-Level Challenges

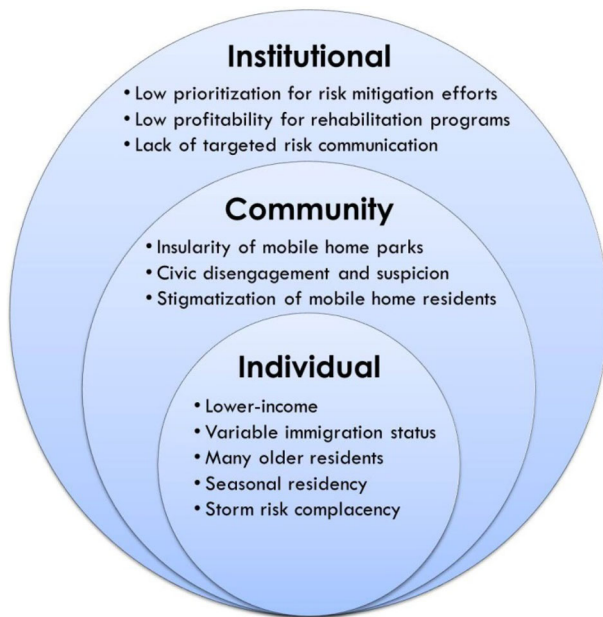
Mobile home residents can be hard to reach due to the frequently seasonal nature of their tenancy in South Florida. Residents are disproportionately lower income, older

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**Fig. 1** Individual-, community-, and institutional-level research challenges associated with mobile home residents in South Florida

adult (over 65), and often have undocumented immigration status. These demographics introduce potentially diverse linguistic barriers, and results in residents often being reluctant to speak with anyone (researchers included) who represents a potential informant. They are also often hesitant to put anything into writing, which can complicate informed consent procedures. The lack of any major hurricane making landfall in South Florida since Wilma in October 2005 more than 10 years ago seems to have induced a sense of complacency among many Florida residents (Frazier et al. 2010), who do not always take climate change or sea level rise research seriously. A similar sense of complacency was believed to have exacerbated hurricane-related damage and loss of life in Florida prior to 2005 (Wang and Kapucu 2008), and was likely reinforced last year with minimal damage to eastern Florida during the 2015 storm season. Media reports in the aftermath of Hurricane Matthew, which caused severe flooding in northeastern and central Florida in October 2016, indicated that only 35–50% of people under mandatory evacuation orders complied (Horney 2016) though statistics specific to mobile home residents were not available. In July 2016, prior to Hurricane Matthew, we conducted a pilot feasibility study of mobile home residents' perceptions and behaviors about storm preparedness by distributing questionnaires to nearly 1000 households. We achieved a response rate of just over 5%, well below typical response thresholds of at least 15% sought by nonprofit organizations for return-by-mail surveys (Hager et al. 2003); approximately 0.5% of solicited households

returned their self-addressed, stamped envelope empty or blank in apparent protest.

Experience from past hurricanes and empirical studies on vulnerability also point unequivocally to the high vulnerability of mobile home occupants during and in the immediate aftermath of a disaster (Morrow 1999; Fothergill and Peek 2004). Yet research gaps preclude an in-depth understanding of this subpopulation's vulnerability. For example, although there is strong evidence that mobile home residents are more likely to evacuate during a hurricane (Whitehead et al. 2000; Bowser and Cutter 2015), we know little about the factors—such as risk perception, socioeconomic constraints, and information dissemination—that shape evacuation behavior beyond a resident's housing type. Further study of the social determinants of evacuation decision making would allow a more nuanced understanding of how mobile home residents make evacuation and destination choices, and would subsequently aid disaster planning.

### 3 Community-Level Challenges

In South Florida, most mobile homes are located in mobile home parks (MHP), which creates structural community-level challenges to surveying and working with mobile home residents. MHPs operate as private businesses in South Florida and almost universally post “no solicitation” signs at their entrances. In our experience, MHP managers have not been receptive to our pursuit of vulnerability-themed research, viewing it as an intrusion rather than advocacy. Our overtures to MHP managers to engage their communities with a knowledge, attitudes, and practices questionnaire about sea level rise and hurricane preparedness during July 2016 evoked comments such as “we take care of our people,” and “we don't have any issues to worry about.” This protectiveness indicates a degree of community solidarity, but also suggests a degree of civic disengagement. This is all placed in the greater societal context of Florida's “Stand Your Ground” law, which permits the use of deadly force if someone reasonably believes it is necessary to prevent great bodily harm or death. This is a very serious consideration for field researchers working with suspicious populations in a state associated with frivolous gun violence. If approached appropriately, MHP managers are undeniably important gatekeepers with the potential to shape buy-in for social science research in mobile home communities. The reticence to engage academic researchers is likely a product of decades of stigma against “trailer parks” and similar communities among political institutions and popular culture. The most successful approaches will likely have to engage MHP managers not only as community leaders and

stakeholders, but also as potential advisors and educators in the model of public health programs that use *promotoras*, or lay health advisors, to reach Latino populations (Wasserman et al. 2007). MHP managers who do not believe in climate change or sea level rise still present a challenge. But this belief does not necessarily override their sense of responsibility for their community or willingness to take advantage of risk-mitigating resources if engaged with sincerity and humility.

#### 4 Institutional-Level Challenges

In both research and policy, there is a growing recognition of the two-way linkages between disaster risk reduction and climate change adaptation (Begum et al. 2014). As climate change intensifies and sea levels rise, the risk of floods and more frequent and/or intense storms increases. In a world threatened by these environmental changes, disaster research policy and practice have shifted focus from reactive emergency management in post disaster scenarios to a more proactive strategy aimed at mitigating the risk of hazard exposure. Investment in hazards mitigation strategies, despite being politically unpopular, has positive economic returns due to future societal benefits (Godschalk et al. 2009). An important approach to risk mitigation is dissemination of risk information to vulnerable communities. A recent study of Florida household preferences for receiving hurricane risk mitigation information through an intensive home inspection found that households living in mobile homes are less likely to allow inspection of their homes (Chatterjee and Mozumder 2014). Although the reasons for this reluctance of mobile home residents to seek hazard risk information are not clearly understood (and may be related to any of the aforementioned factors or to something else), such disengagement is consistent with our experiences and perceived challenges in reaching out to the occupants of mobile home parks.

In addition to risk information dissemination, another way to mitigate hurricane loss is to renovate or upgrade existing mobile homes and communities through structural enhancements. A report from the International Hurricane Research Center (IHRC) found that in many communities prejudice against mobile homes is a major obstacle to the participation of mobile home residents in government renovation programs (IHRC 2004). Because mobile housing is considered personal property and not real property, both public and private sector actors are often reluctant to commit funds to mobile home enhancements. It was therefore not surprising that IHRC found private sector companies to be underrepresented in mobile home renovation projects. The propensity for disengagement on the

part of mobile home residents, when coupled with the tendency of other stakeholders (particularly private enterprises) to overlook the needs of this subpopulation, compounds the challenge of developing predisaster mitigation programs aimed at alleviating mobile home resident vulnerability.

#### 5 Conclusion

Mobile home residents are a highly vulnerable subpopulation in South Florida that merit further study focused on the improvement of sociopolitical engagement and reduction of exposure to climate change and sea level rise. Currently, there are more than 50,000 mobile homes in the South Florida counties of Miami-Dade, Broward, and Palm Beach. These residential structures comprise roughly 2.5% of all housing stock in the region. By overlaying maps of mobile home locations, surge zones, and floodplains in a geographic information system, we calculated that roughly 33% of all mobile homes are in the 100-year floodplain and 27% are in the storm surge zone (with some geographic overlap). As the climate changes and sea levels rise, storm-induced surges will become higher, the 100-year floodplain may experience more intense and frequent floods, and areas currently outside the flood risk zone may become incorporated into the flood zone. This is the new reality to which all low lying coastal locations, including densely populated South Florida, are adjusting. The impacts of a changing climate are not distributed equitable, and those living in mobile housing will be disproportionately affected by these changes. Our efforts to reach out to this subpopulation in order to assess their needs, concerns, perceptions of risk, and preparedness in the face of this new reality have been met by several challenges to community buy-in and participation. Researchers must confront these challenges, continue to advocate for mobile home residents, and provide a platform for all potentially vulnerable subpopulations, such as low-income elderly or recent immigrants, to become engaged stakeholders in their communities. In our view, understudied groups represent an untapped opportunity for refining our understanding of natural hazard vulnerability, building resilience, and improving health equity.

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